Proposal Reviews

#213: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

University of California, Davis, Agronomy Department

Final Selection Panel Review	
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Final Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Final Selection Panel Review

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

Please provide an overall evaluation rating.

Fund	
As Is	**-**
In Part	**X**
With Conditions	**-**
Consider as Directed Action	**-**
Not Recommended	**-**

Amount: **$1,892,916**

Conditions, if any, of approval (if there are no conditions, please put "None"):

Cut expenses ten percent from amount budgeted by increasing economy of effort rather than eliminating tasks

Provide a brief explanation of your rating:

The Clean Estuary Partnership has expressed the opinion that task 1 should strategically determine which pesticides are of greatest concern for water quality and ensure that the study evaluate these pesticides. They also feel that task 2 should include attainment of water quality standards as an (performance) indicator. While it may not be within the scope of this research project to account for all current and potential scenarios of pesticide use and impacts of farm runoff on water quality, the panel encourages this research group to consider these comments as their research into agricultural runoff unfolds and interface with groups that have both a strong background and interests in water quality.

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	**-**
In Part	**X**
With Conditions	**-**
Consider as Directed Action	**-**
Not Recommended	**-**

Amount: **$1,892,916**

Conditions, if any, of approval (if there are no conditions, please put "None"):

Cut expenses ten percent from amount budgeted by increasing economy of effort rather than eliminating tasks,

Provide a brief explanation of your rating:

The strength of this proposal is that it is highly applied research directed at a major problem for the Bay-Delta region, it has a high probability of success given that these techniques (conservation tillage and cover crop systems) have proven useful elsewhere and it includes both research and education elements. Reviewers expressed surprise that this kind of research had not already been conducted and implemented, given its application elsewhere. This proposal in many ways embodies the type of research proposal CALFED is seeking because of strong stakeholder involvement, strong technical marks from reviewers as well strong support among regional reviewers. The educational component was also considered a major strength. The panel recommends funding, but with several of the reviews suggesting addressing of additional issues.

A major concern of at least one reviewer was the lack of an element in the proposal addressing the issue of impacts to groundwater related to pesticides and nutrients associated with different tillage and cropping practices. This would seem to be an important omission and the panel felt that an effort should be made to address this issue in the future.

Although the project involves many elements, the costs are high and not completely justified. The panel believes the project can be accomplished without detriment to the results at a slightly reduced level of funding. Several cost share components are identified in the proposal and the selection panel expects that they will remain fully committed to the project, despite the reduction in support from CALFED.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XSuperior	**This study is well designed, was ranked highly by regional and scientific reviewers, and is likely to make a significant contribution to developing farming methods that will lead to improvement of water quality in the Bay/Delta.**
-Above average	
-Adequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

   The project is both timely and important, and it is surprising that research such as this has not already been done given the extensive agriculture in the region and the proven effectiveness of conservation tillage and cover cropping in other parts of the country. The projects goal is to evaluate the economic and ecological costs and benefits of conservation tillage and cover cropping in California irrigated agriculture. Ecological assessments will include measurement of export of sediment, nutrients and pesticides from demonstration plots.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

The approach of using demonstration plots has a high likelihood of success. The project team has already been working at some of these sites, has established relationships with growers, and has a good study design. Consideration needs to be given to the need for groundwater sampling and to criteria used for site selection so that results can be more broadly applicable across the region. The likelihood of success appears high.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   The project is likely to contribute significantly to developing management approaches that improve water quality in the Bay/Delta.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Budget seems appropriate.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   Delta and Sacramento regions ranked it high and the San Joaquin ranked it low, because they argued that Sacramento should decide on this because of where the work is being done. Regions ranked the proposal high because it demonstrates practical approaches to clean water protection, was well designed and shows strong stakeholder involvement.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

   No prior performance review; no problems noted in either budget or environmental reviews.

Miscellaneous comments:

None

Delta Regional Review:

Proposal Number: 213

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

Overall Ranking: **-**Low **-**Medium **X**High

Provide a brief summary explanation of the committee's ranking:

The regional panel favors environmental water quality projects that demonstrate practical clean water protection and that provide the information most likely to be helpful in making decisions about clean water policy and action in the Delta.

The proposal has several beneficial aspects for water quality, water use efficiency, and even flood control.

Additionally, CT and CC have a good track record in other parts of the country.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Study has already begun. They are seeking funds to continue for four years and to add more farmland to the study base.

   They propose to pit conventional farming against conservation tillage and cover crop methods.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Reduces pesticide and turbidity runoff. Goal 6.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Study results may offer reduction methods for fine sediment, pesticides, and nutrients. Information gathered here, or in conjunction with this proposal, could be used to reduce sediment loading of the San Joaquin River system, which could reduce impacts on dissolved

oxygen in the SJ River and historical organochlorine pesticides.

Yolo RCDs Sustaining Agriculture and Wildlife Beyond the Riparian Corridor.

4. Does the project adequately involve local people and institutions?

XYes **-**No

How?

Ag workshops, newsletters, and use of local farmers in addition to UCD plots.

Other Comments:

Potential to improve percolation of precipitation, which would improve drought preparedness and could reduce localized flooding impacts. CT and CC may only be suitable for certain areas.

These methods would also increase the organic content of soils which can be beneficial.

San Joaquin Regional Review:

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

Overall Ranking: **X**Low **-**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

Due to the nature of projects and the fact that most of this work was going to happen in the Sacramento Valley area, the committee felt that Sacramento Valley group should decide on this.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   People are currently participating in programs that have impact in this area. Any improvment that achieves leasing of costs generally is very well received by farm community.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Cutting sediment loads out of delta is a priority.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Being more passive in nature this system allows for more development of local ecology as it relates to field level systems.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

How?

By the nature of it, it is working promarily with local communities and their continuing education and economic survival.

Other Comments:

none

Sacramento Regional Review:

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

Overall Ranking: **-**Low **-**Medium **X**High

Provide a brief summary explanation of the committee's ranking:

The proposal is a well-designed project with strong stakeholder involvement and outreach.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   No constraints - full, interdisciplinary team, needed study & result dissemination, ready sites, & growers, links other CALFED projects, long-term commitment to the project, other partners and cost share.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Meets ERP goals 2, 4, 6. Science priorities, Draft Impl. Plan & MR-5. Also M-R Ed programs for adult & K-12, especially high school students in FARMS program.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Linked to other CALFED projects such as the Yolo RCD 2001 project & FARMS. Data and results from project will be widely disseminated and available to other CALFED-funded projects that are working to reduce pollutants from ag lands to rivers and restoration sites.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

How?

Very strong involvement with growers in all phases of experiments and in dissemination to other growers, decision-makers, agencies, students, etc.

Other Comments:

Very good proposal with many strengths in an area where this kind of information and outreach is needed and growing. A key project in the future success of CALFED priority goals.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **213**

Applicant Organization: **University of California, Davis, Agronomy Department**

Proposal Title: **The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

None

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**This is an extremely relevant and well organized, multidisciplinary project that stands a high chance of success. Despite potential difficulties of fully achieving Task 2 objectives the project offers enough other benefits that even partial success of Task 2 goals would be sufficient to deem the project a success. The scope of the project is well defined, the applicants have a proven track record to work together on similar projects (and at the same field site), stakeholder involvement and public education aspects of the project are also high.**
-Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goals of this project are to 1) study the effects of conservation tillage and cover cropping on the export of sediment, nutrients, and pesticides in runoff from conventional and organic farming systems; 2) begin to evaluate the feasibility and sustainability of conservation tillage and cover cropping and quantify their ecological and economic costs and benefits and the tradeoffs between them; and 3) extend the results of the study and demonstrate conservation tillage and cover cropping to interested parties.

Given the scale of agriculture in the Bay-Delta region it would seem that research to minimize ecological impacts while maximizing economic returns would be an area of high priority.

The goals and priorities of ERP and how the project addresses them are detailed in Table 5. The hypotheses under Task 1 are clearly stated and readily testable. However several (most) of the hypotheses under Tasks 2 and 3 are readily testable.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The proposed project basically builds upon previous studies comparing different farming practices at a large-scale field level. It is intended to use the same site which has been convreted to a long-term study area.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The design of the field experiments is well thought out and statistically sound and has certainly benefited from the applicants' previous experience at the site. The authors give some examples of Task 2 indicators but state that 'numerous others exist which we fully expect to identify and use.' This seems overly ambitious to me. I am also unclear has to how these different indicators will be combined to give an overall picture of costs and benefits (combining apples and oranges?).

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   Yes the approach is fully detailed and based on similar, previous studies. This, and the fact that the team has worked together before suggest a high likelihood of success. My only concern is the feasibility with regard to identifying and quantifying cost/benefit indicators which is extremely difficult and contentious.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Performance measures have been described in detail (Table 3). They include primary research publications as well as a variety of outreach materials and a publicly available database of runoff properties.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Products have been detailed in Table 3 of the application. Tasks 1 and 3 would appear to provide products of clear value; Task 2 is more problematic given the uncertainties involved in this kind of cost-benefit analysis. The outreach aspect of previous similar projects with which the applicants have been involved appear to have been highly successful. It would be expected that a

similar degree of outreach activities would occur in the proposed project. The practical information provided to farmers with regard to adopting new farming practices is also likely to be of value.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The qualifications of the team and their responsibilities in the proposed project are detailed in Table 6. The team encompasses a variety of disciplines (from soil biogeochemistry, nematology, economics, etc) and appears to have the necessary expertise to address the proposed research questions. The team has previously worked together and is familiar with the study site, both of which add to the strength of the project. The applicants identify weather conditions as the main constraint to the feasibility of the study. The team is relatively large and this will increase demands on the project management.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   This 3 year project has a total budget of $1,557,955. More expensive than average (I think?) but the costs seem to be justified.

Miscellaneous comments:

The applicants never actually define conservation tillage or cover cropping.

Active involvement of farmers at every stage of the project is a strength of the project and should contribute to its success.

It is not entirely clear how the IACT project with which the applicants are currently involved relates to the proposed project (is it the same questions being addressed but over a longer timeframe?).

The ecological and economic indicators to be used to evaluate the feasibility and sustainability of different farming practices to be compared have not been completely identified. In Table 2, it is not clear how the parameters to be measured will be translated into Task 2 indicators. It is stated that identification of appropriate indicators will be achieved via 'an exhaustive literature search'. The applicants may be underestimating how difficult it will be to do this.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **213**

Applicant Organization: **University of California, Davis, Agronomy Department**

Proposal Title: **The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The proposed research will provide important data on farming practices that could reduce non-point source inputs in this region. I am very surprised that this research has not already been done. My concern is that inadequate attention has been paid to groundwater and to site selection so that results from small scale fields can be extrapolated to the larger landscape.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goal of the project is to evaluate the economic and ecological costs and benefits of conservation tillage and cover cropping in California irrigated agriculture and to work with farmers and growers to inform them of their findings. The efficacy of these management practices will be assessed in several demonstration plots by monitoring export of sediment, nutrients and pesticides. The concept is both timely and important.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   Investigators assert that although conservation tillage and cover cropping has been extensively studied in the midwest, little is know of its efficacy in irrigated California agriculture. I am astonished that his has not already been done. Given the importance of agriculture in the state and the benefits of these practices observed elsewhere, it is very important that this type of analysis be done for California agriculture.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach proposed is to use plots (several 1/3 acre plots on the research station and four sets of 1/2 acre plots in farmer's fields) to follow N, P, DOC, TSS and pesticide exports at a wier. No mention is made of any groundwater sampling. That strikes me as a major omission. Surely agriculture has impacted groundwater quality, and that impact may be altered by conservation tillage or cover cropping. That is a potential benefit that will not even be considered. I am also concerned about the growers' fields to be chosen. That has not yet been done, so it is not clear whether willing participants will be found. More importantly, no criteria are given for site selection. To be able to assess the impact of these practices at a larger landscape scale, it is important that different environmental settings (physical and social) be included. For example, what soil type, slope, previous farming practices, size of farm, type of crop grown will be selected. Determining these criteria and selecting sites that are representative of the range of conditions in the area will facilitate extrapolation to the larger landscape.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   It is technically feasible, although the goal of extrapolating their results to the larger landscape requires greater attention to site selection criteria. Feasibility also assumes that they will be able to identify growers who are willing to participate in the study.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   The proposal is very vague about indicators of ecological condition that will be used to evaluate the effectiveness of conservation tillage practices.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   This proposal has the potential for producing a very useful product. Farmer involvement in the design of the project is an important aspect of its usefulness.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The team appears to have the expertise needed. There has been considerable evidence of outreach efforts in past projects, and that is good. What is missing from the proposal is any measure of the effectiveness of that outreach. To what extent have the practices that have been suggested in the past been applied in the fields? That is the measure of outreach that is really needed.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   The project will support 3 full time researchers, 1 post doc and 9 students. That seems like a lot of people, but considerable work is proposed.

Miscellaneous comments:

Environmental Compliance:

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   XYes **-**No

   If no, please explain:

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   XYes **-**No

   If no, please explain:

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 213

Applicant Organization: University of California, Davis, Agronomy Department

Proposal Title: The ecological and economic costs and benefits of alternative agricultural practices: Sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   XYes **-**No

   If no, please explain:

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   XYes **-**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

   If no, please explain:

7. Are there other budget issues that warrant consideration?

-Yes **X**No

If yes, please explain:

Other Comments: